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## **Red Hat Enterprise Linux Release 9.2 Manual Pages on 'EVP\_PKEY\_derive\_init.3ossl' command**

**`$ man EVP_PKEY_derive_init.3ossl`**

**EVP\_PKEY\_DERIVE(3ossl)      OpenSSL      EVP\_PKEY\_DERIVE(3ossl)**

### NAME

EVP\_PKEY\_derive\_init, EVP\_PKEY\_derive\_init\_ex,  
EVP\_PKEY\_derive\_set\_peer\_ex, EVP\_PKEY\_derive\_set\_peer, EVP\_PKEY\_derive  
- derive public key algorithm shared secret

### SYNOPSIS

```
#include <openssl/evp.h>

int EVP_PKEY_derive_init(EVP_PKEY_CTX *ctx);
int EVP_PKEY_derive_init_ex(EVP_PKEY_CTX *ctx, const OSSL_PARAM params[]);
int EVP_PKEY_derive_set_peer_ex(EVP_PKEY_CTX *ctx, EVP_PKEY *peer,
                                int validate_peer);
int EVP_PKEY_derive_set_peer(EVP_PKEY_CTX *ctx, EVP_PKEY *peer);
int EVP_PKEY_derive(EVP_PKEY_CTX *ctx, unsigned char *key, size_t *keylen);
```

### DESCRIPTION

EVP\_PKEY\_derive\_init() initializes a public key algorithm context ctx for shared secret derivation using the algorithm given when the context was created using EVP\_PKEY\_CTX\_new(3) or variants thereof. The algorithm is used to fetch a EVP\_KEYEXCH method implicitly, see "Implicit fetch" in provider(7) for more information about implicit

fetches.

`EVP_PKEY_derive_init_ex()` is the same as `EVP_PKEY_derive_init()` but additionally sets the passed parameters `params` on the context before returning.

`EVP_PKEY_derive_set_peer_ex()` sets the peer key: this will normally be a public key. The `validate_peer` will validate the public key if this value is non zero.

`EVP_PKEY_derive_set_peer()` is similar to `EVP_PKEY_derive_set_peer_ex()` with `validate_peer` set to 1.

`EVP_PKEY_derive()` derives a shared secret using `ctx`. If `key` is `NULL` then the maximum size of the output buffer is written to the `keylen` parameter. If `key` is not `NULL` then before the call the `keylen` parameter should contain the length of the key buffer, if the call is successful the shared secret is written to `key` and the amount of data written to `keylen`.

## NOTES

After the call to `EVP_PKEY_derive_init()`, algorithm specific control operations can be performed to set any appropriate parameters for the operation.

The function `EVP_PKEY_derive()` can be called more than once on the same context if several operations are performed using the same parameters.

## RETURN VALUES

`EVP_PKEY_derive_init()` and `EVP_PKEY_derive()` return 1 for success and 0 or a negative value for failure. In particular a return value of -2 indicates the operation is not supported by the public key algorithm.

## EXAMPLES

Derive shared secret (for example DH or EC keys):

```
#include <openssl/evp.h>
#include <openssl/rsa.h>

EVP_PKEY_CTX *ctx;
ENGINE *eng;
unsigned char *skey;
size_t skeylen;
EVP_PKEY *pkey, *peerkey;
/* NB: assumes pkey, eng, peerkey have been already set up */

ctx = EVP_PKEY_CTX_new(pkey, eng);
if (!ctx)
    /* Error occurred */
if (EVP_PKEY_derive_init(ctx) <= 0)
    /* Error */
if (EVP_PKEY_derive_set_peer(ctx, peerkey) <= 0)
    /* Error */

/* Determine buffer length */
if (EVP_PKEY_derive(ctx, NULL, &skeylen) <= 0)
    /* Error */

skey = OPENSSL_malloc(skeylen);

if (!skey)
    /* malloc failure */

if (EVP_PKEY_derive(ctx, skey, &skeylen) <= 0)
    /* Error */
```

`/* Shared secret is skkey bytes written to buffer skkey */`

## SEE ALSO

`EVP_PKEY_CTX_new(3)`, `EVP_PKEY_encrypt(3)`, `EVP_PKEY_decrypt(3)`,  
`EVP_PKEY_sign(3)`, `EVP_PKEY_verify(3)`, `EVP_PKEY_verify_recover(3)`,  
`EVP_KEYEXCH_fetch(3)`

## HISTORY

The `EVP_PKEY_derive_init()`, `EVP_PKEY_derive_set_peer()` and  
`EVP_PKEY_derive()` functions were originally added in OpenSSL 1.0.0.

The `EVP_PKEY_derive_init_ex()` and `EVP_PKEY_derive_set_peer_ex()`  
functions were added in OpenSSL 3.0.

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